

**EXPLANATION OF SIGNIFICANT DIFFERENCES
ATLAS TACK CORPORATION SUPERFUND SITE
FAIRHAVEN, MASSACHUSETTS**



SDMS DocID

457759

I. INTRODUCTION

A. Site Name and Location

Site Name: Atlas Tack Corporation Superfund Site
Site Location: Bristol County, Fairhaven, Massachusetts

B. Lead and Support Agencies

Lead Agency: U.S. Environmental Protection Agency
Support Agency: Massachusetts Department of Environmental Protection

C. Legal Authority

Under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. §9617(c) and promulgated in 40 C.F.R. Sections 300.435(c)(2)(I) and 300.825(a)(2), and the U.S. Environmental Protection Agency ("EPA") guidance (Office of Solid Waste and Emergency Response ("OSWER") Directive 9355.3-02), if EPA determines that differences in the remedial action significantly change but do not fundamentally alter the remedy selected in the Record of Decision ("ROD") for the Site with respect to scope, performance or cost, EPA shall publish an explanation of significant differences ("ESD") between the remedial action being undertaken and the remedial action set forth in the ROD and the reasons such changes are being made.

D. Summary of Circumstances Necessitating this Explanation of Significant Differences

The 2000 ROD requires that where contaminated material was to be removed from the Site, those areas would be re-graded and re-vegetated so as to restore them to their original, pre-contamination condition, to the extent possible. Thus, the ROD contemplates that wetland areas as existed at the Site prior to 1901 (when the facility was constructed) would be restored. Similarly, the ROD specifically states that any saltwater marsh would be restored to its original pre-contamination condition. At the time of remedy design, however, EPA determined that due to the restriction on tidal flow into the saltwater marsh north of the hurricane dike, the area of saltwater marsh had to be designed with a smaller footprint. Additionally, a freshwater wetland adjacent to the saltwater marsh, which is believed to have expanded in size over the years (also likely due to the construction of the hurricane dike) and now also includes the wetland that had been lost due to filling, has now also been restored.

This newly restored freshwater wetland requires as much groundwater as possible from the upland areas in order to sustain standing water, a key feature in the design of the wetland,

necessary to minimize the growth of the common reed (*Phragmites australis* or *Phragmites a.*), an invasive species. This design goal, however, would be substantially frustrated by the phytoremediation component of the remedy, which was selected as an enhancement to the monitored natural attenuation ("MNA") for contaminated groundwater at the Site. The phytoremediation component, as contemplated, would consist of planting trees in the upland area of the Site to lower the groundwater table, thereby limiting groundwater flow through areas where residual contamination remains.

For the reasons discussed more fully herein, notwithstanding the possible enhancement benefit to the MNA component of the remedy, EPA determined that lowering the groundwater table would not allow for enough groundwater flow into the freshwater wetland area, which in turn would increase the risk of *Phragmites a.* invasion. The relatively minor gain from lowering the groundwater table, which would also take several years to realize, is outweighed by the ecological benefits of a flourishing freshwater wetland on the Site. Accordingly, the trees will not be planted. This decision is the subject of this ESD.

E. Availability of Documents

This ESD and other supporting documents can be found in the Administrative Record located at EPA's Region I – New England Records Center, located at One Congress Street, Suite 1100, Boston, Massachusetts 02114-2023 with hours from Monday thru Friday 9 a.m. - 5 p.m. and at the Millicent Public Library, 45 Center Street, Fairhaven, Massachusetts 02719.

II. SUMMARY OF SITE HISTORY AND SELECTED REMEDY

A. Site History

The roughly 48-acre Site is located at 83 Pleasant Street in Fairhaven, Massachusetts, approximately one-half mile from Fairhaven Center. The surrounding area is predominantly residential. It is bounded by a bike path, residences, and a few commercial/light industrial businesses to the north, a tidal marsh to the east and south, an elementary school about 200 feet to the northwest, and residences immediately to the south and west. A hurricane dike, built in the early 1960s, runs northeasterly through the marsh area of the Site. Approximately 7,200 people live within one mile of the Site, and approximately 15,000 live within three miles.

This Site's CERCLIS identification number is MAD001026319. EPA is the lead agency at the Site. The Site includes the entire Atlas Tack property (currently owned by Atlas Tack Corporation), unimproved property adjacent to the Atlas Tack facility owned by the Hathaway-Braleay Wharf Co. ("Hathaway-Braleay"), and portions of Boys Creek and the adjacent saltwater tidal marsh extending to Buzzards Bay. The marsh and creek parcels located south of the dike are owned by Atlas Tack Corporation ("Atlas Tack"), the Town of Fairhaven and the Commonwealth Electric Company.

The Atlas Tack facility was built in 1901 and historically manufactured wire tacks, steel nails, rivets, bolts, shoe eyelets and similar items. The facility operated electroplating, acid-washing,

enameling, and painting processes until 1985. Process wastes containing acids, metals and solvents were discharged into drains in the floor of the main building, into Boys Creek marsh, and into an on-site lagoon. The lagoon effluent discharged to the salt marsh and Boys Creek. This approximately 10,000 square foot unlined surface impoundment contained more than 350,000 gallons of hazardous liquid waste and sludge prior to closure of the facility. The lagoon was partially remediated in 1985 by Atlas Tack under the direction of Massachusetts Department of Environmental Protection ("MassDEP").

Chemicals also permeated the floors and timbers of buildings and migrated to adjacent soil and groundwater. Industrial fill was deposited on top of the original marsh surface to the east of the Atlas Tack buildings. The 3.2 acre portion of a 6.2 acre parcel of property owned by Hathaway-Braley on Church Street, about 500 feet southeast of the main Atlas Tack building, also received waste from a number of sources. The major contaminants of concern at the Site include heavy metals, including arsenic, antimony, lead, copper, chromium, zinc, nickel and cadmium; volatile organic compounds, mainly toluene; semi-volatiles organic compounds, mainly polycyclic aromatic hydrocarbons ("PAHs") and polychlorinated biphenyls ("PCBs"); cyanide; and pesticides. Soil, surface water, sediment and groundwater have been impacted.

In February 1990, the Site was placed on the National Priorities List making it eligible for federal funding for investigation and cleanup. The Remedial Investigation/ Feasibility Study ("RI/FS") was completed in 1998. As noted above, the ROD was signed in March 2000.

Groundwater beneath and in the vicinity of the Site is contaminated, and at the time of the Remedial Investigation concentrations of several contaminants of concern exceed Maximum Contaminant Levels ("MCLs"). While the groundwater is not used as a drinking water supply, it is a conduit for migration of contaminants from the source areas into the marsh, Boys Creek and eventually Buzzards Bay. Accordingly, interim groundwater cleanup goals are ecologically based.

Given the anticipated future use of the Site, commercial/industrial use, worker exposure to contaminated soil in the Commercial Area is considered the principal human health threat at the Site. Human health risks are also posed by ingestion of contaminated shellfish from Boys Creek. Ecological threats include substantial risk from exposure to contaminated soil and sediment by invertebrates, fish and wildlife such as the meadow vole, black duck and blue heron through direct contact and dietary exposure.

B. Summary of Selected Remedy and Implementation

For the purposes of the investigation and remedy selection, the Site was divided into the Commercial Area; the Solid Waste and Debris Area ("SWDA"), which includes the former lagoon and fills areas; the Marsh and Creek Bed Areas, and the Groundwater (See Figure 1).

The selected remedy called for the demolition of the rear three-story section of the main manufacturing building, the power plant building and concrete slabs beneath the buildings, and excavation and off-site disposal of approximately 55,000 cubic yards of contaminated soil,

sludge, debris and sediment. To address contaminated groundwater, the remedy includes monitored natural attenuation ("MNA") enhanced by phytoremediation. As will be discussed in greater detail below, the phytoremediation chosen essentially consists of planting trees to lower the groundwater table in an effort to minimize flow through residual contamination in the soil. Similar to the site investigation and remedy selection, the Remedial Action construction was divided into three phases: Phase I – Commercial Area; Phase II – the SWDA and Phase III – the Marsh and Creek Bed Area and side-wide restoration.

Phase I

The Atlas Tack facility originally consisted of a sprawling single-story main manufacturing building that connected a two-story front office building on the west side and a three-story building on the rear (east side). Additionally, a separate power plant building, which contained a laboratory, and several ancillary out buildings were also located in the Commercial Area. The single-story main manufacturing building (i.e., the middle portion) was demolished by court order in 1998. The foundation slab and underground trenches and pits remained, however.

Phase I included the demolition of the three-story portion, the power plant building, the concrete slabs beneath these buildings and the existing slab under the previously demolished one-story main manufacturing building; excavation and off-site disposal of contaminated soil and sludge beneath the buildings, slabs and other portions of the Commercial Area to appropriate disposal facilities. A 185 ft high smoke stack located adjacent to the power plant building was also demolished. Prior to demolition, a hazardous materials survey was conducted to identify and remove hazardous materials within and around the buildings prior to demolition. A total of 5,480 cubic yards of contaminated soil and 775 cubic yards of plating sludge (RCRA listed waste F009) was excavated and disposed of off-site in Phase I.

Following demolition and subsequent to excavation and off-site disposal of materials, the Commercial Area was backfilled and graded for use as a stockpile and staging area to support Phase II and III activities such as soil processing and storage of soil, debris and sediment prior to off-site disposal. After completion of the Phase II and III activities, the staging/stockpiling area was then decommissioned, graded, topsoil added and hydro-seeded to facilitate proper site drainage during site-wide restoration.

Phase II – Solid Waste and Disposal Area

Just east of the Commercial Area, the SWDA consists of the Fill Area, the Former Lagoon Area on the Atlas Tack Corporation property and the Commercial and Industrial Debris Area ("CID"), located on property owned by Hathaway-Brale. Approximately 36,660 cubic yards of contaminated soil and debris were removed during this phase, slightly less than the ROD estimated of 38,000 cubic yards.

Groundwater monitoring began at the start of Phase II and two rounds have been conducted to date. Although several shallow wells were unavoidably destroyed during excavation activities, eight new groundwater monitoring wells were installed on September 24 through 26, 2007.

These new wells were specifically located so as to substitute for the destroyed wells and to adequately monitor natural attenuation.

Most of the fill areas remediated in this phase were originally saltwater marsh or wetland in 1901 prior to the construction of the manufacturing facility. The remedy called for these areas to be restored to their original condition to the extent possible. This restoration, including final grading, occurred in Phase III.

Phase III – Boys Creek Marsh and Boys Creek

This final phase of construction consisted of excavation of contaminated marsh soil and creek bed sediment and restoration of the area. The ROD required that a bioavailability study in the Marsh Area be performed to better define the extent of the areas requiring excavation, thereby avoiding, to the extent practicable, the unnecessary destruction of any floodplain, wetland or riverfront area. This study was conducted between 2001 and 2004. Cleanup levels were developed based on the correlation between the level of contamination (principally metals) and associated toxicity data for each sampling location. Areas in the marsh were then delineated for excavation.

The total quantity of marsh and creek bed sediment removed was 36,430 cubic yards. Results obtained from the bioavailability study determined that excavation north of the dike and east of the creek as well as excavation of portions south of the dike be included. The total amount of marsh soil excavated exceeded the ROD estimate by about 20,284 cubic yards.

For the marsh restoration, distinct freshwater and saltwater wetlands were constructed adjacent to each other, but separated by a clay core earthen berm. The excavated and restored areas have been replanted with a variety of native species. The freshwater wetland was designed with steep slopes and a low elevation with standing water to minimize *Phragmites a.* invasion. Final grading was designed to replicate the elevation contour lines that existed in 1901 (prior to facility construction and manufacturing activities at the Site). A detailed maintenance plan has been prepared for marsh and creek monitoring and maintenance. Side-wide restoration also occurred in this phase.

III. EXPLANATION OF SIGNIFICANT DIFFERENCES

The 2000 ROD requires that where contaminated material was to be removed from the Site, those areas would be re-graded and re-vegetated, so as to restore them to their original, pre-contamination condition, to the extent possible. Thus, the ROD contemplates that wetland areas as existed at the Site prior to 1901 (when the facility was constructed) would be restored. Specifically applicable to reconstruction of the salt marsh areas north of the hurricane dike, the ROD identified the following restoration goal:

Salt marsh areas that are excavated to remove contamination will be regraded and revegetated to the approximate original conditions of the remediated area. Erosion protection will be provided in each area, as appropriate, to prevent bank scouring and erosion.

The area north of the hurricane dike consisted in large measure of saltwater marsh. However, a small freshwater wetland exists on the Hathaway-Braley property (CID Area). This wetland, which may have increased in size due to the construction of the hurricane dike in the early 1960s, was further expanded in the restoration of the former fill areas to their original contours. Notwithstanding the possible enhancement benefit to the MNA component of the remedy, EPA determined that lowering the groundwater table would not allow for enough groundwater flow into the freshwater wetland area, which in turn would increase the risk of *Phragmites a.* invasion. The relatively minor gain from lowering the groundwater table, which would also take several years to realize, is outweighed by the ecological benefits of a flourishing freshwater wetland on the Site.

Thus, during the marsh restoration design, a decision was made to reconstruct this area (east and south of the Commercial Area) as an approximately two-acre freshwater wetland and to reconstruct the remaining marsh area as a saltwater marsh. A clay core earthen berm with spillways was constructed to separate the two wetland areas (See Figure 2). The wetland bottom elevation was lowered to allow for increased groundwater infiltration to occur and to allow for a sustained standing water wetland. In addition, the side slopes of the wetland were designed at a 2:1 slope. These two features serve to minimize the growth of the invasive species *Phragmites a.*, which dominated this area prior to remediation. In addition, to enhance groundwater flow into the wetland even further, an infiltration trench was constructed during the restoration phase.

The decision to reduce the saltwater marsh footprint was required because there is an insufficient tidal flow into the marsh north of the dike to support a larger saltwater marsh area. The tidal flow in this area is limited by the hurricane dike, which has only a 48-inch diameter culvert permitting Boys Creek to run through it. With a decrease in water availability, *Phragmites a.* took root in several areas at the edges of the marsh. Thus, the reconstructed marsh area was designed to be a size that can be sustained hydraulically based upon the diameter of the culvert and volume of water flow through it. As described above, the remaining former marsh area was reconstructed as freshwater wetlands. This wetland design, however, would also be substantially frustrated by phytoremediation, which was an innovative technology component selected in the 2000 ROD as an enhancement to the MNA groundwater remedy.

The ROD anticipated that risks from the groundwater would be significantly reduced by primarily removing contamination sources to the groundwater. Groundwater contamination would be further reduced by MNA. For inorganic compounds, natural attenuation is expected to involve chemical transformation, sorption and dilution. For organic compounds, natural attenuation is expected to involve the same mechanisms applicable to the inorganic compounds and also biodegradation. This remedy would also be enhanced by planting trees to lower the groundwater elevation passively. This in turn would minimize groundwater flowing through residual contamination. Trees would be selected that do not take up contamination (mainly metals) and would be planted in areas where groundwater is not influenced by the ocean or tidal action in Boys Creek. The ROD estimated that it would take approximately 10 years from the contaminated source removal for the groundwater to meet cleanup goals.

EPA, with the concurrence of MassDEP, determined that the phytoremediation component of the groundwater remedy would very likely interfere with the sustainability of the freshwater wetland. The only location where trees could be planted to have an effect on the groundwater is directly upgradient of the wetland at the eastern end of the Commercial Area. If the groundwater elevation were to be lowered, there would not be a sufficient volume of water entering the wetland. Insufficient water in the wetland would lead to invasive plant growth, particularly *Phragmites a.*, eventually resulting in a low value habitat wetland. Additionally, because it would take several years for the trees to become large enough, and the tree roots to be deep enough, to lower the groundwater, the phytoremediation component would not begin to make any significant difference for several years. Accordingly, the relatively minor enhancement benefit of the phytoremediation to the MNA component of the remedy is outweighed by the ecological benefits of a flourishing freshwater wetland on the Site

Finally, groundwater has been monitored since late 2007, just subsequent to the source removal and monitoring continues on a semi-annual basis. The trend in most wells located where the source material was removed, or downgradient of it, already shows a general decrease in concentrations of zinc, nickel, copper and cyanide in the groundwater. Surface water in the freshwater wetland was sampled in April 2009 and meets Ambient Water Quality Criteria. Continued monitoring will be performed (pursuant to a 30-year program) and the results will be evaluated during the five year review.

Although the cost per acre to construct the freshwater wetland is somewhat greater than the per acre cost to restore the saltwater marsh, and the area of freshwater wetland increased over the original projection, the overall increase in the cost of the remedy due to the differences described here, including not planting trees, amounts to less than one percent of the total remedy cost. Moreover, the remedy as now designed is expected to be more cost effective because money is not wasted in the restoration of saltwater marsh areas that ultimately cannot be sustained hydraulically, and therefore would likely be invaded by *phragmites a.*, resulting in a low habitat wetland.

IV. SUPPORT AGENCY COMMENTS

The MassDEP has reviewed this ESD and supports EPA in its issuance.

V. AFFIRMATION OF STATUTORY DETERMINATIONS

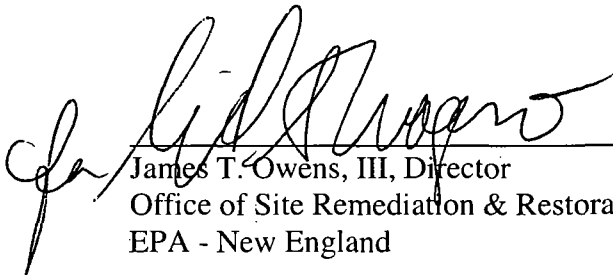
EPA believes that the remedy as adjusted herein remains protective of human health and the environment, and satisfies the requirements of Section 121 of CERCLA. The changes made in this ESD have not changed the remedial action objectives for the Site. Rather, the modifications to the remedy described herein will allow the remedy to continue to perform in a cost-effective, practicable manner while meeting all of the statutory requirements of CERCLA.

VI. PUBLIC PARTICIPATION

This ESD and supporting information are available for public review at the locations and times identified in the introduction of this document. In addition, a notice of availability and brief description of the ESD will be provided to a local newspaper of general circulation, the New Bedford Standard Times.

VII. DECLARATION

For the foregoing reasons, by my signature below, EPA is issuing this Explanation of Significant Differences for the Atlas Tack Corporation Superfund Site in Fairhaven, Massachusetts.


James T. Owens, III, Director
Office of Site Remediation & Restoration
EPA - New England

9-16-09
Date

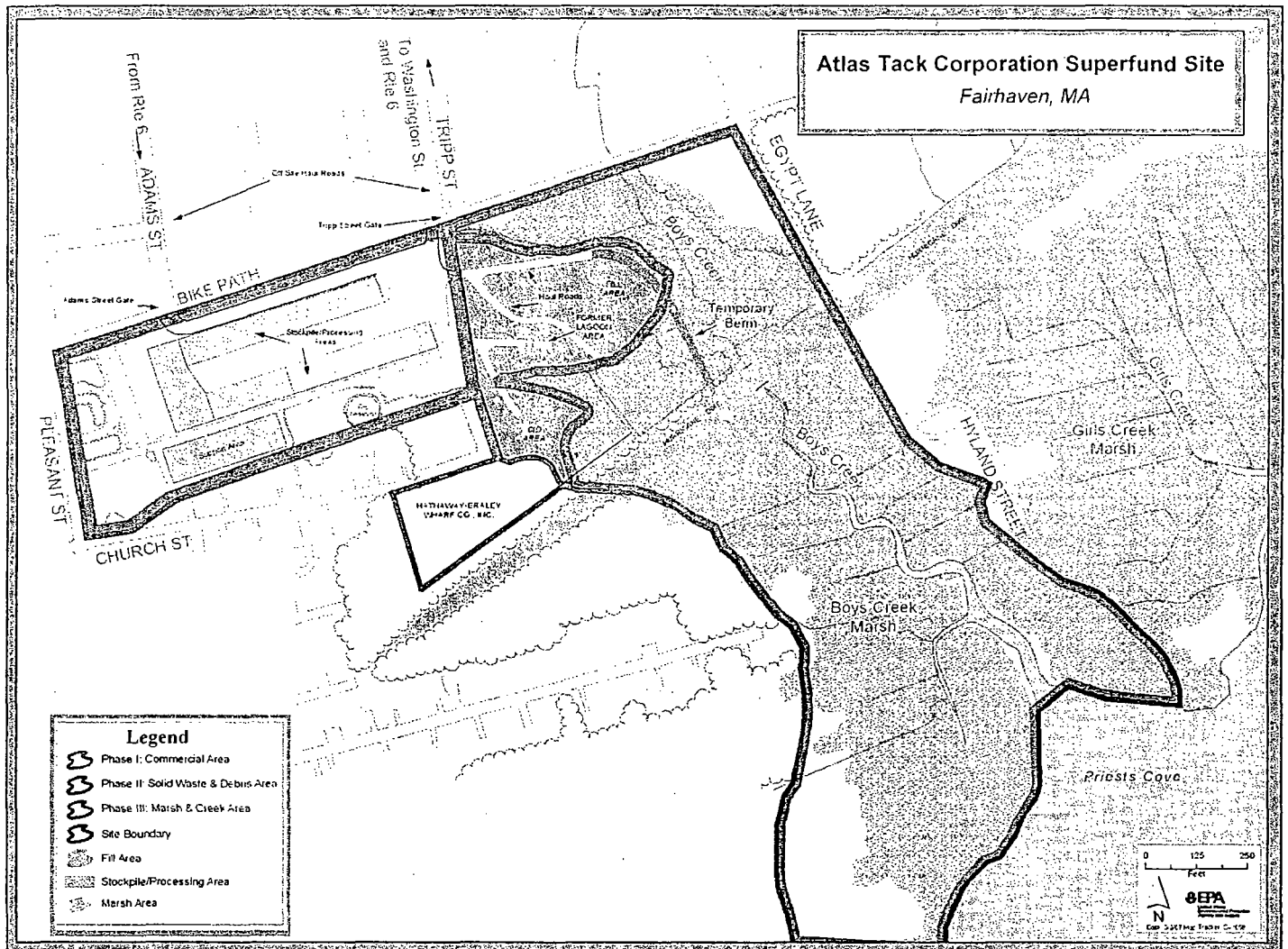


Figure 1 - Site Map

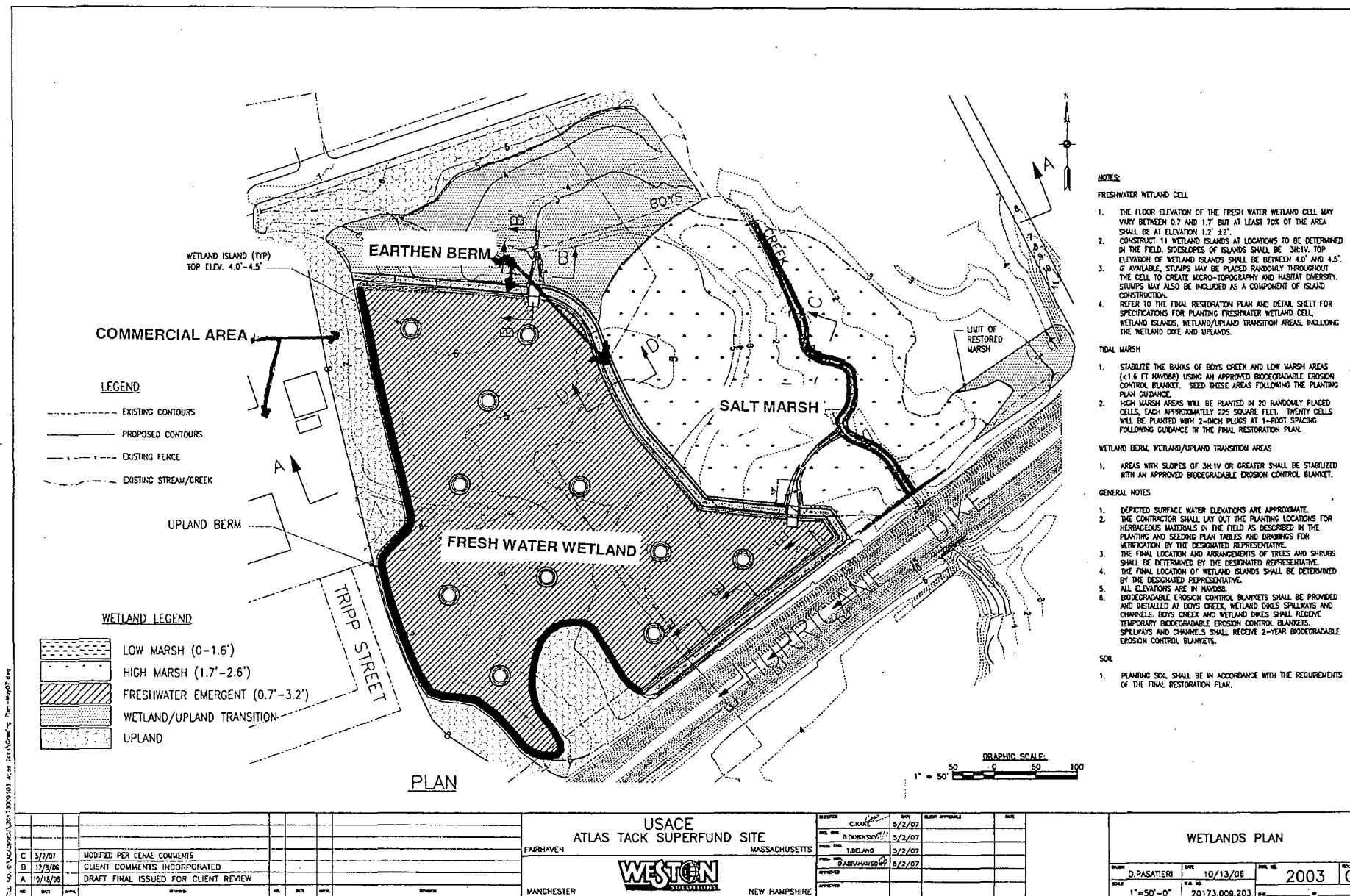


Figure 2